

EPA Superfund Explanation of Significant Differences:

**CHEMICAL SALES CO.
EPA ID: COD007431620
OU 01
DENVER, CO
03/27/2000**

**CHEMICAL SALES COMPANY SUPERFUND SITE
OPERABLE UNIT I - PLUME AREA
EXPLANATION OF SIGNIFICANT DIFFERENCES**

March 2000

INTRODUCTION

The purpose of this document is to explain the significant differences between the remedy selected in the Record of Decision (ROD) for the Chemical Sales Company Superfund Site (Site), Operable Unit I (OU1), in Adams County and the City and County of Denver, Colorado, issued by the U.S. Environmental Protection Agency (EPA) on 27 June 1991, and the remedy described herein. The changes to the ROD have been made as a result of new information that EPA and the Colorado Department of Public Health and Environment (CDPHE) received subsequent to the issuance of the ROD, during the process of Remedial Design. These changes do not fundamentally alter the remedy presented in the OU1 ROD. The OU1 remedy for the Site remains protective of human health and the environment.

CDPHE is the lead agency for performing the cleanup at OU1 of the Site; EPA is the support agency.

This Explanation of Significant Differences (ESD) provides a brief history of the Site, describes the remedy selected in the ROD, and explains the ways in which the remedy described herein differs from the remedy selected in the ROD. It also summarizes the support agency's comments on the changes to the remedy and discusses compliance with all legal requirements.

This ESD is prepared in fulfillment of EPA's public participation responsibilities under Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. Section 9601, et seq. (CERCLA or Superfund), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and Section 300.435(c)(2)(i) of the National Contingency Plan (NCP), 40 C.F.R. Part 300. These laws and regulations require the lead agency to publish an ESD when the remedy to be implemented differs significantly from the remedy described in the ROD. This ESD will become a part of the administrative record as required by the NCP, 40 C.F.R. Section 300.825(a)(2).

PUBLIC PARTICIPATION

The administrative record, which contains this ESD and the documentation supporting it, is available for public review at the following locations:

EPA Superfund Records Center
999 18th Street, 5th floor North Terrace
Denver, Colorado 80202
(303) 312-6473
Hours: Monday-Friday - 8:00 a.m. to 4:30 p.m.

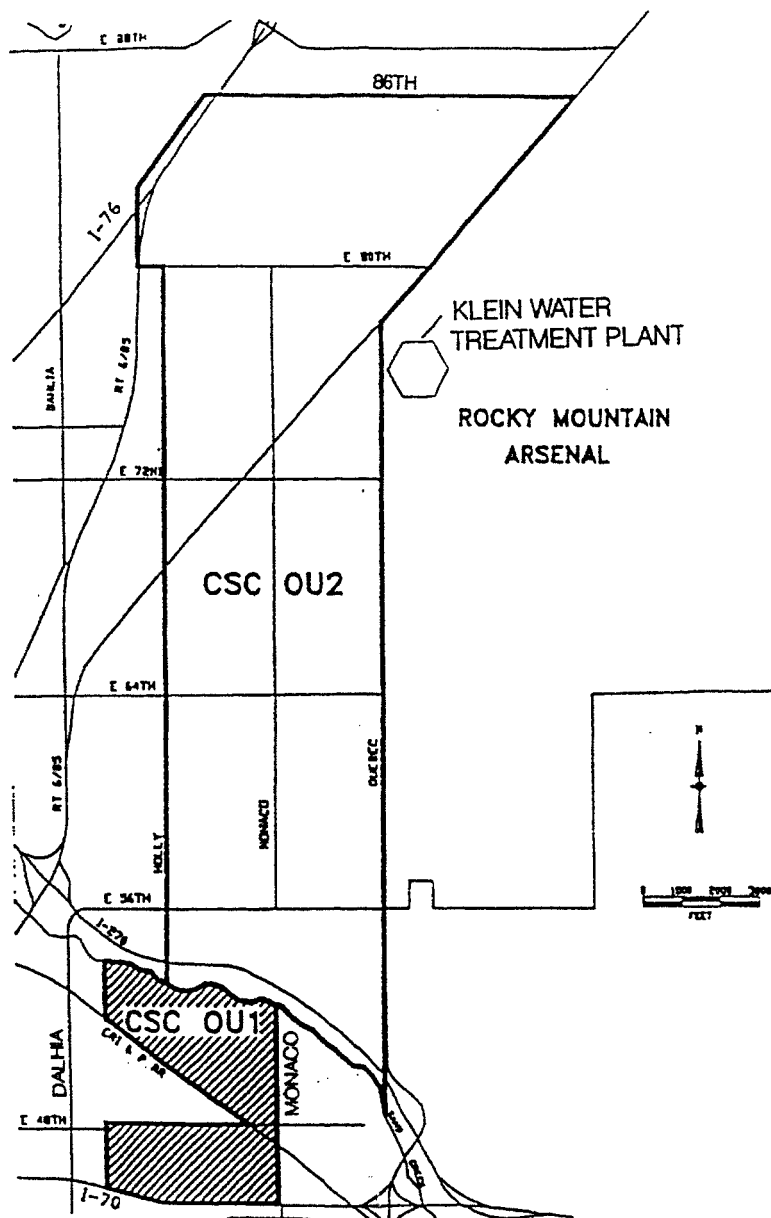


FIGURE 1: SITE LOCATION MAP
CHEMICAL SALES COMPANY SUPERFUND SITE

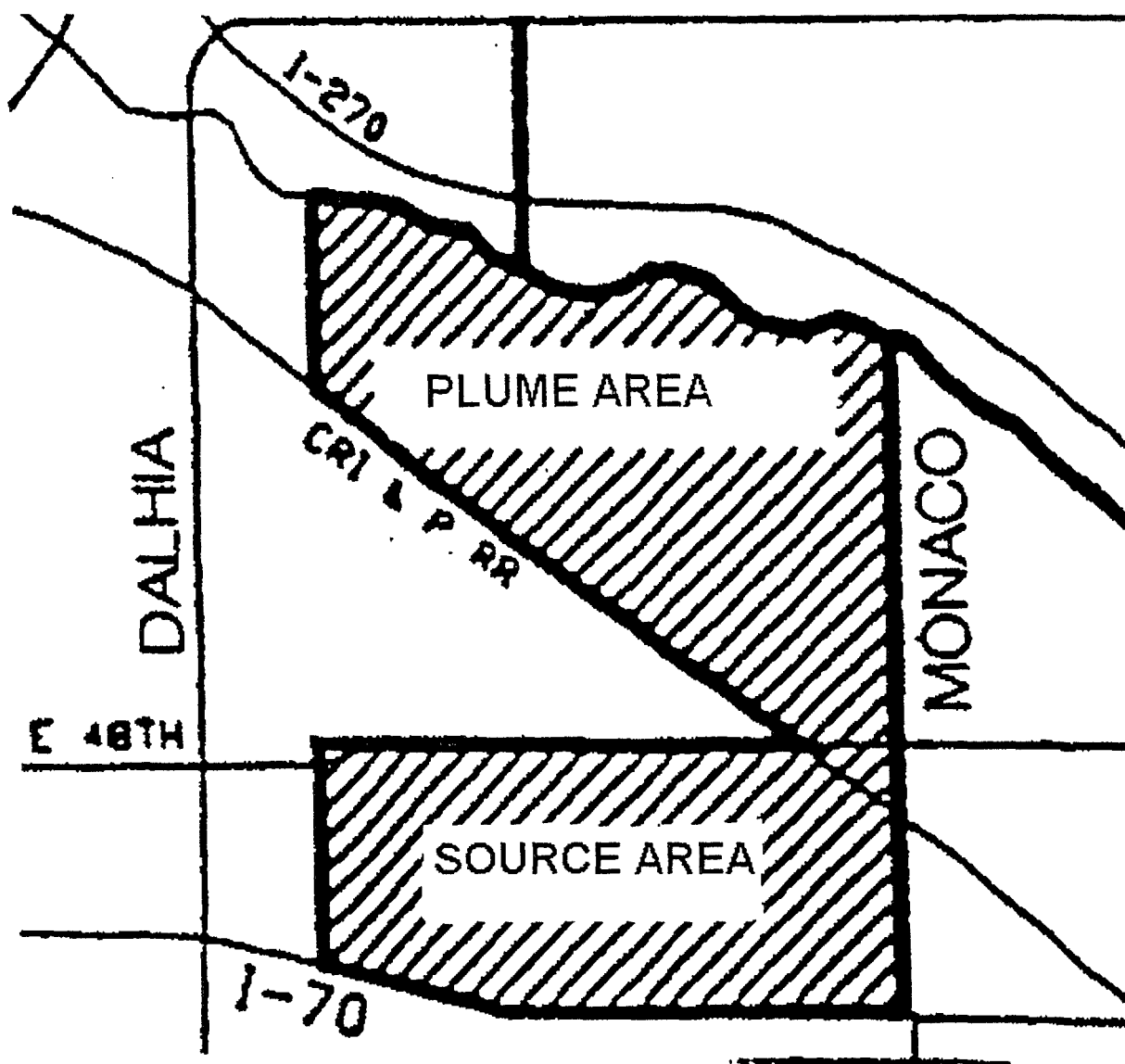


FIGURE 2: SOURCE AND PLUME AREAS OF OPERABLE UNIT 1
CHEMICAL SALES COMPANY SUPERFUND SITE

Colorado Department of Public Health and Environment
Record Center
Building B, Second Floor
4300 Cherry Creek Drive South
Denver, Colorado 80246
(303) 692-3312
Hours: Monday-Friday - 8:00 a.m. to 5:00 p.m.

A notice of availability and brief description of the ESD was published in the Denver Post and Rocky Mountain News on 08 August 1999, as required by CERCLA Section 117(c).

CDPHE accepted public comment on this proposed modification to the OU1 remedy for a period of thirty (30) days. The comment period was from 08 August 1999 to 08 September 1999. Written comments were submitted to:

Joseph Vranka
Project Manager
Colorado Department of Public Health and Environment
Mail Code HMWMD-RP-B2
4300 Cherry Creek Dr., S.
Denver, Colorado 80246-1530

Responses to comments received during the public comment period are contained in Appendix A, Responsiveness Summary, attached to this ESD.

SUMMARY OF SITE HISTORY, CONTAMINATION PROBLEMS, AND SELECTED REMEDY

Summary of Site History and Contamination Problems

In 1981, an EPA-sponsored nationwide random sampling of drinking water systems identified that local ground water, South Adams County Water and Sanitation Districts (SACWSD) potable water source, was contaminated with organic chemicals. This finding and the findings of subsequent studies led to the discovery of the Chemical Sales Company (CSC) as a source of organic chemical contamination, namely volatile organic compounds (VOCs), in the area.

EPA proposed placing the CSC Site on the National Priorities List (NPL) in June 1988. The listing was finalized in August 1990. The Site was subsequently divided into four Operable Units (OUs). The subject of this ESD is the plume area of OU1.

OU1 is located in Denver and Commerce City. The plume area of OU1 consists of the area south of Sand Creek, and north of East 48th Avenue, between Monaco and Forest Streets, in Adams County. The source area includes the former CSC facility at 4661 Monaco Street, and consists of the area south of East 48th Avenue, north of Interstate 70, west of Monaco Street, and east of Forest Street.

OU1 is approximately one-half square mile in size and consists of primarily light industrial and commercial land uses. The CSC property in the source area is approximately seven acres in size, and was owned by CSC from 1976 through 1995. The CSC was a wholesale distributor of commercial/industrial chemicals, detergents, and water leisure products. Operations included the storage and repackaging of bulk chemicals from railcars, tank trucks, and drums.

In 1989, EPA and CSC entered into an agreement requiring CSC to conduct a Remedial Investigation/Feasibility Study (RI/FS) for OU1. The RI/FS was completed in February 1991. The OU1 ROD, which identified the remedy selected for OU1, was signed in June 1991.

CSC began Remedial Design activities for OU1 in February 1992, under an Administrative Order from EPA. After completing some preliminary design investigation activities, CSC declared bankruptcy in April 1994. After notifying CSC of noncompliance with the Administrative Order, EPA tasked their contractor to perform the Remedial Design for OU1. EPA conducted Remedial Design to the draft final stage by September 1995. The lead agency role was subsequently transferred to CDPHE, which completed the remaining portion of the design by May 1998. In the course of conducting these activities, EPA and CDPHE obtained new information on hydraulic conductivity, saturated thickness, sustainable pumping rates, and contaminant fate and transport. The new information included in the following documents resulted in the need for this ESD:

CDM Federal Programs Corporation, 1995. *Intermediate Design Report, Chemical Sales Company OU1 Remedial Design*. June 19. Appendix A: Design Basis Memorandum, and Appendix B: Remedial Design Field Investigation Data Summary Report.

CDM Federal Programs Corporation, 1995. *Interim 100% Opinion of Probable Costs for Remedial Design, Operable Unit No. 1*. August 22.

CDM Federal Programs Corporation, 1995. *Draft Final Design Report, Chemical Sales Company OU1 Remedial Design*. September 11. Appendix A: Design Basis Memorandum.

CDM, 1998. *Report - Plume Area Evaluation, Chemical Sales Company Site, OU1*. June 19.

EPA, 1999. *Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites*. April 21. OSWER Directive No. 9200.4-17P.

CDM, 2000. *Modeling Evaluation of Remedial Alternatives, Chemical Sales Company OU1*. January.

CDPHE, 2000. Correspondence to EPA: *Cost Comparison of Monitored Natural Attenuation Versus Pumping Alternatives for the Plume Area of OU1*. 16 March.

The ESD and the new information are available in the EPA Superfund Records Center and the CDPHE Hazardous Materials and Waste Management Division Records Center.

Summary of Selected Remedy for the Plume Area of OU1

The selected remedy in the 1991 ROD for OU1 consisted of components for both the source and plume areas. The selected remedy for the plume area of OU1 includes the following components:

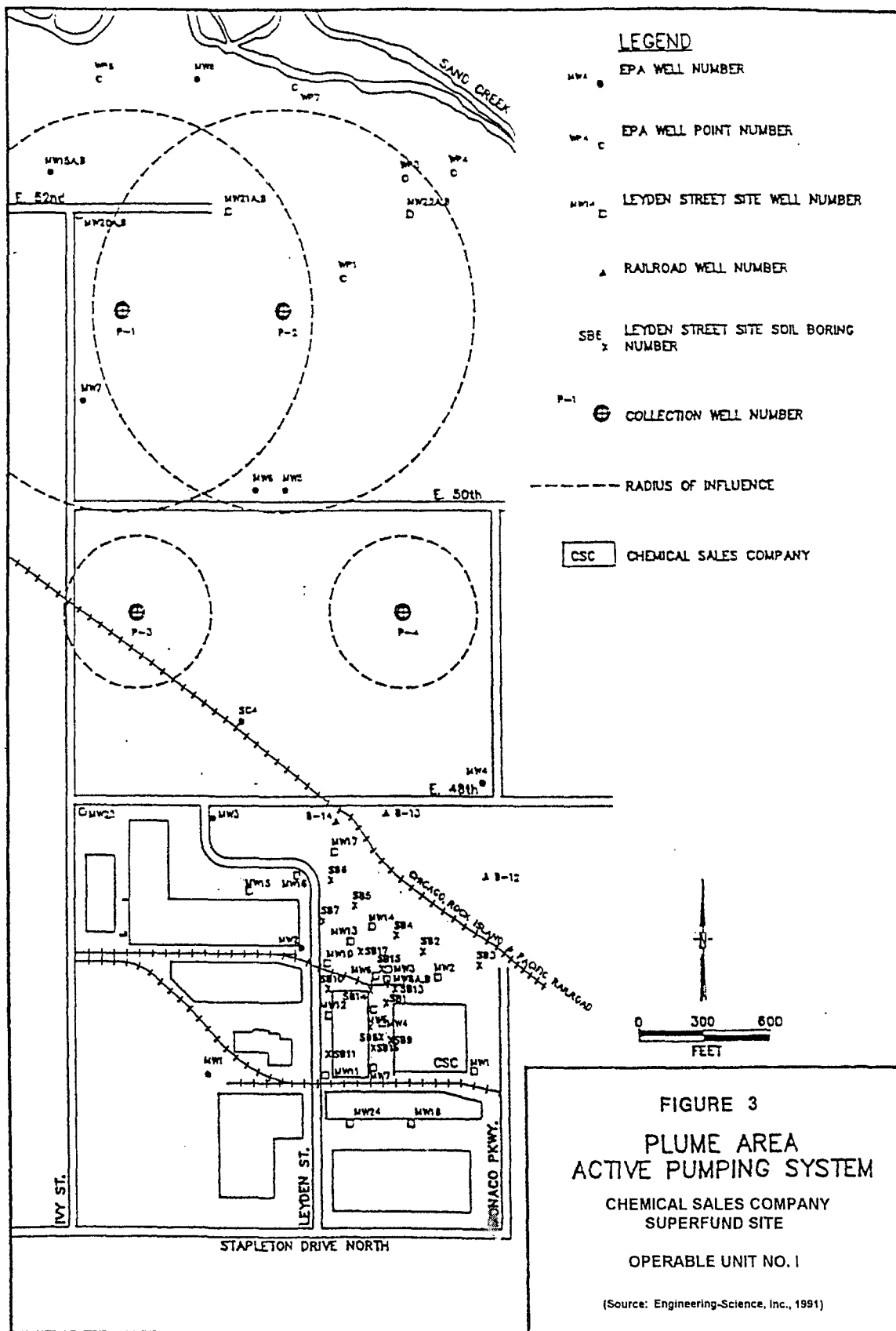
- < Monitoring ground water, discharged treated water and air;
- < Notification by the Colorado State Engineer's Office of the potential health risks associated with use of contaminated ground water upon request for an alluvial well permit within the OU1 area;
- < High volume (1,000 gpm) ground water extraction within the CSC plume area (area north of East 48th Avenue and south of Sand Creek);
- < Treatment of contaminated ground water with an air stripping tower located near East 52nd Avenue; and
- < Reinfiltration of treated ground water through discharge into a trench or gravel pit for the plume area.

DESCRIPTION OF SIGNIFICANT DIFFERENCES AND THE BASIS FOR THOSE DIFFERENCES

Use of Monitored Natural Attenuation Rather Than Active Remediation

The changes described in this ESD are based on remedial design documents that have been produced by Camp Dresser & McKee Federal Programs Corporation, under contract to EPA, and by Camp Dresser & McKee, Inc., under contract to CDPHE. CDPHE and EPA have considered the proposed changes and have determined that the information supports the need to modify certain aspects of the remedy described in the ROD. These changes do not fundamentally alter the overall approach of the OU1 remedy.

Basis for Change. During design activities, new information from hydrogeologic investigations indicated that the selected remedy would be less efficient and effective at accomplishing remediation goals. The design hydraulic conductivity value (K value), derived from ground water pumping tests, was significantly less than the value reported in the RI/FS and used in the ROD. The change in the K value and in the saturated thickness of the more permeable zones resulted in a significant reduction in the predicted radii of influence, or capture zone, for ground water extraction wells. The lateral capture zone predicted in the RI/FS and ROD was as much as 900 feet per extraction well. The new information led to a lateral capture zone of only 25 to 50 feet per well. This reduction in the capture zone would require that the four extraction wells required in the ROD be increased to 61 extraction wells. Instead of drawing ground water from the entire plume area, as the wells required by the ROD were intended, the significantly reduced capture zone required that the 61 extraction wells be arranged in a line along East 52nd Avenue. This allowed contaminated ground water to be collected only after it had already migrated naturally to within 50 feet of East 52nd Avenue.



Remedial design ground-water pumping tests showed that achievable pumping rates were 10 to 20 times less than estimates from the RI/FS (7 versus 80 gpm for the shallow zone and 0.25 versus 5 gpm for the deep zone). Even with 61 wells instead of the four required by the ROD, the ground water extraction rate was reduced from 1,000 gpm required by the ROD to 375 gpm.

Evaluation of Third Option. Further design investigations were performed to evaluate a third option, monitored natural attenuation in the plume area. New sampling data from the investigation indicates that the contaminant plume is no longer increasing in extent and is shrinking. The evaluation of the plume area ground water determined that no significant biodegradation of contaminants is occurring, but contaminant concentrations in ground water have decreased by a factor of ten over the past several years due to dispersion, dilution, and sorption of contaminants onto the soil matrix. These processes are among the natural attenuation mechanisms identified in EPA's guidance on monitored natural attenuation. Monitored natural attenuation reduces potential risk at the site by reducing contaminant concentrations, thereby reducing potential exposure levels. EPA guidance suggests that monitored natural attenuation would be appropriate for this component of the remedy because:

- (1) the source of contaminants is being removed by soil vapor extraction and air sparging in the source area;
- (2) contaminated ground waters will be returned to their beneficial uses within a time frame which is reasonable when compared to more active measures (pumping and treatment);
- (3) land use in the area is primarily commercial/industrial and there is no current domestic use of ground water;
- (4) institutional controls, including zoning and notification upon application for well permits, will continue to protect human health from existing ground water contamination until remediation levels are achieved;
- (5) surface water is not adversely impacted and the selection of monitored natural attenuation would not adversely impact human health, drinking water supplies, surface water, or other environmental resources;
- (6) contaminated soil is being remediated by soil vapor extraction in the source area; and
- (7) remedial activities have included opportunities for public involvement and input into the decision making process.

Ground-Water Modeling and Time Frames for Aquifer Restoration. Preliminary ground-water modeling, based on the new design information, predicted that natural attenuation mechanisms would cause contaminant concentrations in ground water to decrease below MCLs just south of Sand Creek within approximately 11 years. This favorably compared to the time frame from 7 to 13 years estimated by the RI/FS and ROD for aquifer restoration of the plume area, which used limited sampling information and a rudimentary model.

A more sophisticated ground-water model was then performed for the three options using the most current and comprehensive information. The model suggested that monitored natural attenuation would achieve aquifer restoration within approximately the same time frame as both the 61-well pump and treat system and the four-well pump and treat system, when uncertainty in the model is considered.

Cost Effectiveness of Options. Using results from the more sophisticated model and cost estimates, monitored natural attenuation was then compared to the last viable option considered (i.e., the 61-well pump and treat system). The use of monitored natural attenuation rather than the 61-well system will likely increase the time to achieve MCLs by 30% (33 years instead of 25), but reduce the cost by more than 80% (\$976,000 instead of \$5,192,000). Natural attenuation is therefore more cost-effective than the 61-well system. It is also more cost effective than the 4-well system (\$5,995,900), given that the 61-well system is more cost-effective than the 4-well system.

Selected Option: Monitored Natural Attenuation. The selection of monitored natural attenuation will meet all applicable or relevant and appropriate requirements identified in the ROD. There are no action-specific or location-specific requirements for monitored natural attenuation. Chemical-specific requirements, including federal MCLs and State of Colorado Basic Standards for Ground Water apply, and would be met in approximately the same time frame that pumping and treatment would require, when uncertainty in the sophisticated model is considered. The ground water remediation levels identified in the ROD remain unchanged. Ground water will be monitored until remediation levels have been achieved.

SUPPORT AGENCY COMMENTS

EPA concurs with the ESD and the changes to the selected remedy.

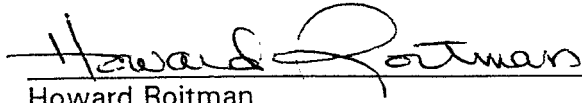
AFFIRMATION OF STATUTORY DETERMINATIONS

Considering the new information that has been developed and the changes that have been made to the selected remedy, EPA and CDPHE believe that the modified remedy remains protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to this remedial action, and is cost-effective. In addition, the revised remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable for this Site.



Max H. Dodson
Assistant Regional Administrator
Office of Ecosystems Protection and Remediation
U.S. Environmental Protection Agency, Region 8

3/27/00
Date

A handwritten signature in black ink, appearing to read "Howard Roitman", written over a horizontal line.

Howard Roitman

Director

Hazardous Materials and Waste Management Division
Colorado Department of Public Health and Environment

March 23, 2002
Date

LIST OF ACRONYMS

ARARs	Applicable or Relevant and Appropriate Requirements
CDPHE	Colorado Department of Public Health and Environment (also known as CDH)
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
C.F.R.	Code of Federal Regulations
CSC	Chemical Sales Company
EPA	U.S. Environmental Protection Agency
ESD	Explanation of Significant Differences
FS	Feasibility Study
gpm	gallons per minute
MCL	Safe Drinking Water Act Maximum Contaminant Level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
OU	Operable Unit
RA	Remedial Action
RD	Remedial Design
RI	Remedial Investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act of 1986
VOC	Volatile Organic Compound

List of Figures

Figure 1	CSC Site Location Map
Figure 2	CSC OU1 Source and Plume Areas
Figure 3	Plume Area Active Pumping System

Appendices

Appendix	A Responsiveness Summary
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APPENDIX A
RESPONSIVENESS SUMMARY
for
EXPLANATION OF SIGNIFICANT DIFFERENCES
CHEMICAL SALES COMPANY SUPERFUND SITE
PLUME AREA OPERABLE UNIT 1

Highlights of Community Involvement

Community interest in the ground water contamination in south Adams County was intense in 1985 and early 1986 when the problem was first brought to public attention. The Rocky Mountain Arsenal (RMA), which was adjacent to the contaminated public water supply area, was initially identified as a source of the contaminants. Local citizens formed a group called Citizens Against Contamination (CAC), which held a number of well-attended meetings. More than 600 citizens attended the 06 March 1986 meeting. The United States Environmental Protection Agency (EPA) and the Army responded to numerous public and media inquiries, issued press releases for new developments, and attended the public meetings. Community involvement activities were coordinated among the EPA, the Army, and South Adams County Water and Sanitation District (SACWSD). The Colorado Department of Public Health and Environment (CDPHE, formerly Colorado Department of Health) also conducted its own community involvement activities in the area.

Public interest subsided in mid-1986 after a temporary water treatment system funded by the Army and EPA was installed at SACWSD, and treated water was thus made available to the affected residents. EPA connected over 400 residents to the treated municipal water supply. In the fall of 1986, EPA named the Chemical Sales Company (CSC) site as another source of contaminants in ground water. EPA has since issued a number of fact sheets discussing the progress of the investigation and activities at the Site. The CSC was also included in the joint community relations activities with several other south Adams County Superfund Sites.

Proposed plans for Operable Unit I (OU1), OU2, and OU3 were issued concurrently on 25 February 1991. The public comment period was open from 25 February 1991 through 01 April 1991. A public meeting was held on 14 March 1991 at the Commerce City Recreation Center and was attended by 50 to 75 people. The proposed plan for the OU4 Record of Decision was issued on 10 July 1992. The public comment period was open from 10 July 1992 through 08 August 1992. A public meeting was held on 21 July 1992 at the Commerce City Recreation Center and was attended by fourteen people. Details about community involvement throughout the Remedial Investigation (RI) and Feasibility Study (FS) process and public period are included in the responsiveness summaries in the RODs for OU1, OU2, OU3, and OU4.

The proposed second Explanation of Significant Differences for the plume area of OU1 was made available on 08 August 1999. A notice of availability of the proposed second ESD and supporting documents and notification of the public meeting were published in the Denver Post on 08 August 1999. The public comment period was open from 08 August 1999 through 08 September 1999. A public meeting was held at Commerce City Hall in the Commerce City Community Room on 10 August 1999. Ten people attended the meeting. At this meeting,

EPA and CDPHE representatives answered questions about the site and discussed the proposed changes under consideration. A transcript of the public meeting has been entered into the Administrative Record.

Comments and Responses

Three sets of comments were received in written form during the public comment period. The comments were submitted by Tri-County Health Department (TCHD), Commerce City, and United States Congressional Representative Diana DeGette.

CDPHE acknowledges and appreciates TCHD's support for and concurrence with the second ESD, as indicated in their comment letter. The first three comments from TCHD relate to the second ESD, and the responses are provided below.

1. **TCHD Comment:** The *Background Information* as well as the *New Information* sections are confusing and may imply that the "capture zone" is not a horizontal distance across the surface of the ground, but rather a system of capturing water going vertically 900 feet down in to the aquifer. Please clarify these sections to indicate that the capture zone is horizontal in nature and not vertical.

CDPHE Response: The language referenced in the comment has been modified to clarify that the capture zone or radius of influence discussed does, in fact, refer to the horizontal direction. Although there is a vertical capture zone associated with any pumping well, the well spacing is determined by the horizontal radius of influence.

2. **TCHD Comment:** The new design has placed a great deal of reliance on natural attenuation to achieve remedial action objectives. Given that the site is 8 to 9 years old since monitoring began and that another 11 years are needed, according to the new remedy, for natural attenuation to reduce the contaminant levels to remedial action objectives in the plume area, has the contamination mass balance over time shown reductions of 50 percent over time to validate the design calculation?

CDPHE Response: Yes. The data from monitoring wells sampled most recently in 1998 show contaminant levels an order of magnitude below what was found in 1990 (*Plume Area Evaluation Report, Chemical Sales Company Superfund Site OU1*, June 1998). In the source area, for example, at monitoring well LSS-MW7, the concentration of perchloroethylene (PCE) decreased from 4,800 micrograms per liter (Fg/L) in 1990 to 1,200 Fg/L in 1998. In the same well, trichloroethylene (TCE) decreased from 910 Fg/L in 1990 to 300 Fg/L in 1998. In the plume area at monitoring well LSS-MW-22B, PCE decreased from 39 Fg/L in 1990 to 9 Fg/L in 1998, and TCE decreased from 27 Fg/L in 1990 to less than 1 Fg/L in 1998. Although the results for some monitoring wells were mixed, most wells showed much more than a 50% decrease in contaminant concentrations. Since the hydraulic gradient and hydraulic conductivity have not changed appreciably over time, the flow of ground water has also remained relatively constant through the area. The saturated thickness has decreased somewhat over time, suggesting slightly less ground water flow through the area. Since the concentration of contaminants has also decreased, the mass flow of contaminants has decreased as well.

3. **TCHD Comment:** If at the 5-year review natural attenuation has not achieved remedial action objectives or will not within the 11 year time frame, will more aggressive measures be considered and implemented to complete the cleanup in the designated time?

CDPHE Response: Yes. In addition to periodic reviews of the remedy no less frequent than once every five years, a routine ground water monitoring program will be implemented to continually evaluate the progress of the remedy. Ground water monitoring wells will be sampled semiannually and the analytical results compiled in reports. If sampling data demonstrate that monitored natural attenuation is not providing the necessary effectiveness at achieving remedial action objectives, active measures will be considered for implementation, such as pumping and treatment or *in-situ* treatment.

The last two comments from TCHD relate to the non-significant design change to the remedy for the source area of OU1, and are not related to the subject of this second ESD. The design change involved a change in the treatment unit used to control fugitive emissions from the soil vapor extraction system. The OU1 ROD called for catalytic oxidation, and the December 1995 OU1 ESD changed that system to a resin adsorption system with a refrigeration unit to condense and collect contaminants from the vapor. The design changes arising from value engineering performed by the construction contractor involved the use of a zeolite instead of resin as the adsorbent, and a thermal oxidation unit to destroy the contaminants rather than condensing them into liquid form for accumulation and off-site transportation and disposal. The responses are provided below.

4. **TCHD Comment:** This area (Commerce City) is very sensitive to the addition of any new potential odor sources into the area. Have there been any odor issues associated with the technology involved in the new remedy design?

CDPHE Response: No. The zeolite performs similarly to the resin in removing contaminants from the vapor stream. The requirements are the same for the new system as, for the old system. The addition of a thermal oxidizer at the end of the process will not significantly affect the composition of the treated air which is discharged. Federal, state, and local requirements pertaining to air emissions and control of odors will be met.

5. **TCHD Comment:** The addition of a thermal oxidation system to the remedy may require an air permit through our Air Control Division.

CDPHE Response: Although the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, 1980, 42 U.S.C. § 9601-9675 as amended) states that no federal, state, or local permits are required for remedial actions carried out entirely on site (CERCLA § 121 (e)), the remedy is required to meet the substantive requirements of any such permit. CDPHE will coordinate with TCHD to ensure that local requirements for such treatment units are met.

Comments from Commerce City focus on the length of time it has taken to implement the remedy selected in the OU1 ROD, and concern for the length of time still necessary to achieve cleanup in the plume area. Responses to Commerce City comments are provided below.

1. **Commerce City Comment:** The source of contamination originates at Chemical Sales Company, which is located in Denver, however the plume area affects Commerce City residents and businesses. The City would like to see a more aggressive time frame for clean up given the amount of time that has already elapsed since the 1991 ROD.

CDPHE Response: CDPHE acknowledges the concern for the length of time between the issuance of the ROD and the implementation of the remedy. That delay, however, has not affected the comparison of time frames to achieve remedial action objectives in the plume area under different scenarios from the present time into the future. CDPHE, under a cooperative agreement with EPA, is currently constructing the remedy in the source area to remove the source of contamination. Aggressively removing contaminants from soil and ground water in the source area using a combination of soil vapor extraction and air sparging will promote more rapid attenuation of contaminants in the plume area.

2. **Commerce City Comment:** The publications are misleading in that they refer to the superfund site as being located in Commerce City. It would be more accurate to say the superfund source is located in Denver and the affected area extends north into Commerce City.

CDPHE Response: One of the sources of ground water contamination for the Chemical Sales Company Superfund Site is the former Chemical Sales Company, located in Denver. Contamination from the Chemical Sales Company has migrated into Commerce City and Adams County ground water. Other sources of ground water contamination located in or adjacent to OU2, however, were historically identified. These included the Rocky Mountain Arsenal and an unidentified source of PCE near 56th Avenue and Quebec Street.

CDPHE acknowledges and appreciates Representative DeGette's support for the second ESD, as indicated in her letter. The first comment relates to the second ESD. The response to her comment is provided below.

1. **Representative DeGette Comment:** While I am pleased that a more cost effective cleanup solution has been developed for the Chemical Sales Company Site, costs should not be cut at the expense of human health and the environment.

CDPHE Response: CDPHE agrees with the comment. The modified remedy remains protective of human health and the environment. The threshold criteria that must be met by any remedy are protection of human health and the environment, and compliance with all applicable or relevant and appropriate laws and regulations. Cost considerations are secondary to these two primary criteria.

The second of Representative DeGette's comments relates to the non-significant design change for the source area OU1 remedy, and is not the subject of this ESD. A response to that comment is provided below.

2. **Representative DeGette Comment:** I understand that the contaminants will be destroyed on site rather than shipped off site for treatment and disposal. While this reduces the risk of an accident during the transport of these contaminants through a large urban city, I would appreciate it if you would furnish my office with information about the storage or disposal of waste that results from the thermal oxidation process.

CDPHE Response: Since the thermal oxidation process is used only to oxidize vapor-phase volatile organic compounds, there are no solid residuals. A natural gas fired oxidation chamber oxidizes the chlorinated compounds to carbon dioxide, water, and chlorine. The treated vapor is then sprayed with clean water to remove the chlorine before the clean air is discharged to the atmosphere. After neutralizing the acidity of the water, this slightly salty water is passed through granular activated carbon and is sampled and discharged to the sanitary sewer system.